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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/775,660	02/09/2004	Xiaohe Chen	200300677-1	1438

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EXAMINER
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SHOSHO, CALLIE E

ART UNIT	PAPER NUMBER
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1714

DATE MAILED: 02/13/2006

Please find below and/or attached an Office communication concerning this application or proceeding.

## Office Action Summary

Application No.

10/775,660

Applicant(s)

CHEN ET AL.

Examiner

Callie E. Shosho

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1714

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

### Status

- 1) ☐ Responsive to communication(s) filed on \_\_\_\_.
- 2a) ☐ This action is **FINAL**. 2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

### Disposition of Claims

- 4) ☒ Claim(s) 1-20 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 1-20 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_ are subject to restriction and/or election requirement.

### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

### Priority under 35 U.S.C. § 119

- 12) ☐ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☐ All b) ☐ Some \* c) ☐ None of:
- ☐ Certified copies of the priority documents have been received.
  - ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_.
  - ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).
- \* See the attached detailed Office action for a list of the certified copies not received.

### Attachment(s)

- |  |  |
|--|--|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)  | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. ____ |
| 2) <input type="checkbox"/> Notice of Draftsperson's Patent Drawing Review (PTO-948)   | 5) <input type="checkbox"/> Notice of Informal Patent Application (PTO-152)            |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08)<br>Paper No(s)/Mail Date <u>2/9/04 &amp; 6/7/05</u> . | 6) <input type="checkbox"/> Other: ____  |

**DETAILED ACTION**

**Information Disclosure Statement**

1. It is noted that EP 1308488 has been stricken from the IDS filed 6/7/05 as redundant given that the reference was already cited on the IDS filed 2/9/04.

**Claim Rejections - 35 USC § 102**

2. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

(e) the invention was described in (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent or (2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effects for purposes of this subsection of an application filed in the United States only if the international application designated the United States and was published under Article 21(2) of such treaty in the English language.

3. Claims 1-14 and 17-20 are rejected under 35 U.S.C. 102(e) as being anticipated by Chen et al. (U.S. 6,908,185).

Chen et al. discloses ink jet ink comprising pigment, solvent including 1,2-hexanediol, 1,2-dimethyl-2-imidazolidone, 2-pyrrolidone, and 1,3-bis(2-hydroxyethyl)-5,5-dimethylhydantoin, and polyurethane binder that possesses weight average molecular weight of 1,000-30,000 and acid number of 30-80. Given that the polyurethane binder possesses acid number of 30-80 and given that acid number is a measure of the acid functionality or number of free acid groups, it is clear that the polyurethane is inherently water-soluble due to the presence of the acid groups and would inherently possess water-solubility greater than about 5% at 25 °C.

There is also disclosed process for printing the ink from ink jet printer onto substrate. Although there is no explicit disclosure of ink cartridge, it is clear that ink jet printer would necessarily inherently possess such cartridge in order to store the ink (col.1, lines 8-9, col.4, lines 36-38 and 58-61, col.5, lines 47-55, and col.7, lines 18-32).

Attention is drawn to example B that discloses ink comprising 3% pigment, 1.8% polyurethane possessing molecular weight of 3570 and acid number of 60, 7% 1,3-bis(2-hydroxyethyl)-5,5-dimethylhydantoin, 7% 2-pyrrolidone, and 4% 1,2-hexanediol. Further, it is disclosed that ink possesses surface tension of 35.5 dyne/cm and viscosity of 2.77 cP. There is no surfactant present in the ink.

In light of the above, it is clear that Chen et al. anticipates the present claims.

4. Claims 1-3, 5-9, 13-14, and 17-20 are rejected under 35 U.S.C. 102(e) as being anticipated by Valentini et al. '730 (U.S. 2005/0020730) taken in view of the evidence given in Valentini et al. '629 (U.S. 2003/0184629).

Valentini et al. '730 disclose ink jet ink possessing viscosity less than 3.5 cP and surface tension of 20-70 dyne/cm wherein the ink comprises 0.01-10% pigment, 1-15% solvent including 1,2-alkanediol and glycol ether, and polyurethane. There is also disclosed process for printing the ink from ink jet printer onto substrate wherein the printer comprises ink cartridge (paragraphs 12, 14, 20, 26, 34, 43-44, 53-54, 60-61, 63, and 99).

For specific types of polyurethane, Valentini et al. '730 refers to Valentini et al. '629. It is noted that Valentini et al. '629 discloses the use of 0.2-4% polyurethane that has hydrophilic functionality and possesses acid number of 10-100. Given that the polyurethane possesses acid

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number of 10-100 and possesses hydrophilic functionality and given that acid number is a measure of the acid functionality or number of free acid groups, it is clear that the polyurethane is inherently water-soluble due to the presence of the acid groups and would inherently possess water-solubility greater than about 5% at 25 °C (paragraphs 35-36, 50, 73, and 84).

In light of the above, it is clear that Valentini et al. '730 anticipate the present claims.

**Claim Rejections - 35 USC § 103**

5. The following is a quotation of 35 U.S.C. 103(a) which forms the basis for all obviousness rejections set forth in this Office action:

(a) A patent may not be obtained though the invention is not identically disclosed or described as set forth in section 102 of this title, if the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains. Patentability shall not be negated by the manner in which the invention was made.

The factual inquiries set forth in *Graham v. John Deere Co.*, 383 U.S. 1, 148 USPQ 459 (1966), that are applied for establishing a background for determining obviousness under 35 U.S.C. 103(a) are summarized as follows:

1. Determining the scope and contents of the prior art.
2. Ascertaining the differences between the prior art and the claims at issue.
3. Resolving the level of ordinary skill in the pertinent art.
4. Considering objective evidence present in the application indicating obviousness or nonobviousness.

6. This application currently names joint inventors. In considering patentability of the claims under 35 U.S.C. 103(a), the examiner presumes that the subject matter of the various claims was commonly owned at the time any inventions covered therein were made absent any evidence to the contrary. Applicant is advised of the obligation under 37 CFR 1.56 to point out

the inventor and invention dates of each claim that was not commonly owned at the time a later invention was made in order for the examiner to consider the applicability of 35 U.S.C. 103(c) and potential 35 U.S.C. 102(e), (f) or (g) prior art under 35 U.S.C. 103(a).

7. Claims 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Chen et al. (U.S. 6,908,185) or Valentini et al. '730 in view of Elwakil (U.S. 5,833,743).

The disclosures with respect to Chen et al. and Valentini et al. '730 in paragraphs 3 and 4 above are incorporated here by reference.

The difference between Chen et al. or Valentini et al. '730 and the present claimed invention is the requirement in the claims of pH of the ink.

Elwakil, which is drawn to ink jet ink, disclose the use of ink possessing pH of 9-11 in order to prevent the ink from corroding the printer (col.5, lines 8-19).

In light of the motivation for using ink with specific pH disclosed by Elwakil as described above, it therefore would have been obvious to one of ordinary skill in the art to control the pH of the ink of Chen et al. or Valentini et al. to such values in order that the ink does not corrode the printer, and thereby arrive at the claimed invention.

8. Claim 10 is rejected under 35 U.S.C. 103(a) as being unpatentable over Valentini et al. '730 (U.S. 2005/0020730) in view of Kashiwazaki et al. (U.S. 5,696,182).

The disclosure with respect to Valentini et al. '730 in paragraph 4 above is incorporated here by reference.

The difference between Valentini et al. '730 and the present claimed invention is the requirement in the claims of 1,3-dimethyl-2-imidazolidinone.

Kashiwazaki et al., which is drawn to ink jet ink comprising water-soluble polyurethane, disclose the use of 1,3-dimethyl-2-imidazolidinone as an anti-drying agent. Further Kashiwazaki et al. disclose the equivalence and interchangeability of using 1,3-dimethyl-2-imidazolidinone, as presently claimed, with using glycol ethers, as disclosed by Valentini et al. '730 (col.11, lines 10-11 and 22-28).

In light of the disclosure of Kashiwazaki et al., it therefore would have been obvious to one of ordinary skill in the art to use 1,3-dimethyl-2-imidazolidinone in the ink of Valentini et al. '730 in order to prevent drying of the ink such that the ink clogs the printer nozzles, and thereby arrive at the claimed invention.

9. Claims 1-10, 13-16, and 18-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Nichols et al. (U.S. H2113 H).

Nichols et al. disclose ink possessing surface tension greater than 25 dyne/cm, viscosity of 1.3-5 cP, and pH of 3-10 wherein the ink comprises polyurethane resin emulsion possessing weight average molecular weight of 2,000-45,000 and acid number of 5-70, 1-30% 1,2-hexanediol, 1-20% pigment, and solvent such as N-methyl pyrrolidone. Given that the polyurethane possesses acid number of 5-70 and given that acid number is a measure of the acid functionality or number of free acid groups, it is clear that the polyurethane is inherently water-soluble due to the presence of the acid groups and would inherently possess water-solubility greater than about 5% at 25 °C. There is also disclosed process for printing the ink from ink jet

printer onto substrate wherein the printer comprises ink cartridge (col.1, lines 46-50, col.3, lines 39-43, col.3, line 66-col.4, line 23, col.4, lines 26-27, col.6, lines 8-39, col.11, lines 28 and 39-41, col.12, lines 45-51, col.13, lines 31-33, and col.13, line 61-col.14, line 20).

While Nichols et al. fails to exemplify the presently claimed ink nor can the claimed ink be “clearly envisaged” from Nichols et al. as required to meet the standard of anticipation (cf. MPEP 2131.03), nevertheless, in light of the overlap between the claimed ink and the ink disclosed by Nichols et al., absent a showing of criticality for the presently claimed ink, it is urged that it would have been within the bounds of routine experimentation, as well as the skill level of one of ordinary skill in the art, to use ink which is both disclosed by Nichols et al. and encompassed within the scope of the present claims and thereby arrive at the claimed invention.

10. Claims 1-10 and 17-20 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hirasa et al. (U.S. 2002/0019458) in view of Hayashi (U.S. 6,500,248).

Hirasa et al. disclose ink jet ink possessing surface tension of 30-35 dyne/cm wherein the ink comprises 2-8% pigment, 8-70% water-soluble polyurethane possesses weight average molecular weight of 5,000-20,000 and acid number of 55-150, 5-30% solvent including 2-pyrrolidone. Given that the polyurethane possesses acid number of 50-150 and given that acid number is a measure of the acid functionality or number of free acid groups, it is clear that the polyurethane would inherently possess water-solubility greater than about 5% at 25 °C. The use of surfactant is not required. There is also disclosed process for printing the ink from ink jet printer onto substrate. Although there is no explicit disclosure of ink cartridge, it is clear that ink



jet printer would necessarily intrinsically possess such cartridge in order to store the ink (paragraphs 1, 12, 24, 34, 47, 51, and 55).

The difference between Hirasa et al. and the present claimed invention is the requirement in the claims of 1,2-alkyldiol.

Hayashi, which is drawn to ink jet ink, disclose the use of 10-30% 1,2-alkanediol, i.e. 1,2-alkyldiol, such as 1,2-pentanediol or 1,2-hexanediol in order to improve the color development of the ink and to prevent feathering and bleeding in print (col.3, line 49-col.4, line 8).

In light of the motivation for using 1,2-alkyldiol disclosed by Hayashi as described above, it therefore would have been obvious to one of ordinary skill in the art to use 1,2-alkyldiol in the ink of Hirasa et al. in order to produce ink with improved color development that does not exhibit feathering or bleeding, and thereby arrive at the claimed invention.

11. Claims 13-14 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hirasa et al. in view of Hayashi as applied to claims 1-10 and 17-20 above, and further in view of Ma et al. (U.S. 5,648,405).

The difference between Hirasa et al. in view of Hayashi and the present claimed invention is the requirement in the claims of the viscosity of the ink.

Ma et al., which is drawn to ink jet ink, disclose that acceptable viscosity for ink that is utilized in ink jet printer is less than 10 cP so that the ink has excellent storage stability and does not clog the printer nozzles (col.5, lines 39-59).

In light of the motivation for using ink jet ink with specific viscosity disclosed by Ma et al. as described above, it therefore would have been obvious to one of ordinary skill in the art to use ink with such viscosity in Hirasa et al. in order that the ink has excellent storage stability and does not clog the printer nozzles, and thereby arrive at the claimed invention.

12. Claims 15-16 are rejected under 35 U.S.C. 103(a) as being unpatentable over Hirasa et al. in view of Hayashi as applied to claims 1-10 and 17-20 above, and further in view of Elwakil (U.S. 5,833,743).

The difference between Hirasa et al. in view of Hayashi and the present claimed invention is the requirement in the claims of pH of the ink.

Elwakil, which is drawn to ink jet ink, discloses the use of ink possesses pH of 9-11 in order to prevent the ink from corroding the printer (col.5, lines 8-19).

In light of the motivation for using ink with specific pH disclosed by Elwakil as described above, it therefore would have been obvious to one of ordinary skill in the art to control the pH of the ink of Hirasa et al. to such values in order that the ink does not corrode the printer, and thereby arrive at the claimed invention.

13. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure.

McCovick et al. (U.S. 2004/0110867) disclose ink jet ink comprising pigment, water-soluble polyurethane, and 1,2-dimethyl-2-imidazolidone, however, there is no disclosure of 1,2-alkyldiol as presently claimed.

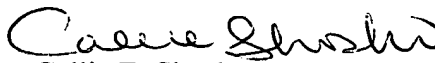
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EP 835890 discloses ink jet ink comprising water-soluble polyurethane and 1,2-alkyldiol, however, the ink comprises dye not pigment as presently claimed.

14. Any inquiry concerning this communication or earlier communications from the examiner should be directed to Callie E. Shosho whose telephone number is 571-272-1123. The examiner can normally be reached on Monday-Friday (6:30-4:00) Alternate Fridays Off.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Vasu Jagannathan can be reached on 571-272-1119. The fax phone number for the organization where this application or proceeding is assigned is 571-273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

  
Callie E. Shosho  
Primary Examiner  
Art Unit 1714

CS  
2/3/06